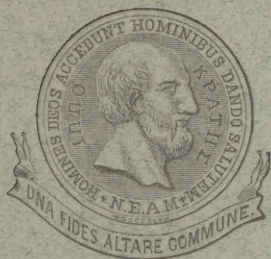


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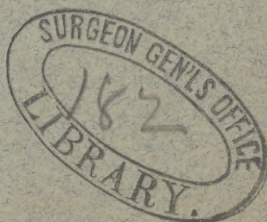
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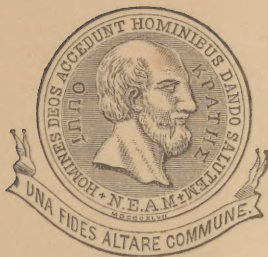
1877.

ANNIVERSARY DISCOURSE.

BY

DR. T. GAILLARD THOMAS.





NEW YORK ACADEMY OF MEDICINE.

1877.

ANNIVERSARY DISCOURSE.

BY

DR. T. GAILLARD THOMAS.



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
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
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THE INFLUENCES WHICH ARE ELEVATING MEDICINE
TO THE POSITION OF A SCIENCE.

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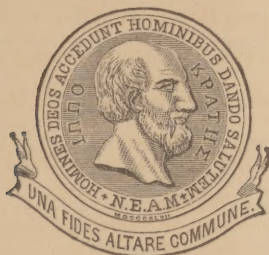
ANNIVERSARY DISCOURSE

DELIVERED BEFORE THE NEW YORK ACADEMY OF
MEDICINE, NOVEMBER 15, 1877.

BY

T. GAILLARD THOMAS, M.D.,

PROFESSOR OF OBSTETRICS AND OF THE DISEASES OF WOMEN AND CHILDREN IN THE COLLEGE
OF PHYSICIANS AND SURGEONS, NEW YORK.



NEW YORK:
PRINTED FOR THE ACADEMY,
12 WEST THIRTY-FIRST STREET.

1877.

ANNIVERSARY ADDRESS.

*MR. PRESIDENT AND GENTLEMEN, FELLOWS OF THE NEW YORK
ACADEMY OF MEDICINE:*

WHEN your kind request was conveyed to me that I should give to-night the address which is customary on each recurring anniversary of this Society, I felt that inclination to decline which is always the first impulse of a busy man who dreads assuming additional labors; but the pleasurable prospect, of standing in your midst, in the friendly relations of this moment, soon dissipated this feeling, and induced me to accept your invitation cheerfully, cordially, and thankfully. As, however, a search through your archives to discover, by an examination of similar efforts on the part of my predecessors, what was required of me, has brought to my notice the chaste and finished addresses of Manley, of Mott, of Stewart, and of Smith; the eloquence and humor of the genial Francis; the learning and research of Watson, of Post, and of Draper; and the able efforts of so many whom I recognize around me now, I have shrunk from the task from a different feeling, a fear that your selection of an orator for the present might belie your sagacity of the past. Unlike those whom I have mentioned, I have neither research nor eloquence to bring you, nor can I offer you, as some of your members have done, the brilliant results of personal investigation and inquiry to be sent forth from these halls to other lands, to take their stand among the contributions of our country to modern medicine.

Failing in ability in these two essential respects, I have chosen as my theme to-night,

“THE INFLUENCES WHICH ARE ELEVATING MEDICINE TO THE
POSITION OF A SCIENCE.”

I trust to your kind indulgence to follow me through a rapid review and comparison of ancient and modern medicine, and

an examination of the causes which are so signally changing the character of the latter, and advancing it from the level of a mere empirical art to the dignity of a science. Should neither interest nor profit result from our study, then will the fault be entirely yours. You will suffer, and suffer justly, from bad judgment in selection of an orator; for surely never yet did theme possess in itself more of absolute merit and importance, or present a better field for gathering instructive and useful lessons. As votaries of the healing art, we "have but one lamp by which our feet are guided, and that is the lamp of experience." What could we more profitably do then than, with retrospective glance, to interrogate this experience as to those influences which have advanced and those which have retarded the most noble of all studies—the science of medicine.

From the earliest periods of civilization medicine has been practised as an art, and men have devoted their lives to the careful observation of the phenomena of disease, the recognition of those developments which would enable them to appreciate the probable course of different affections, and the means of counteracting their baneful influences upon the human system. As centuries rolled on the experience of one generation was, by manuscript records, preserved for those which succeeded it; the wisdom of one race was handed down, as it passed away, to nations which followed it; and each succeeding civilization found itself enriched at the very commencement of its career with the stores of learning accumulated by communities which had gone before.

Through the writings of Diodorus Siculus, of Herodotus, and of Strabo, we obtain a glimpse of the earliest records of medicine as it existed among the ancient Egyptians; and although we glean from them little to admire or to imitate, we learn that in this primeval land the art of medicine had its birth. Here, on the banks of the Nile, in the far distant days of the Pharaohs, undoubted records tell us of men who strove against disease, struggled after progress, and toiled through their generations, as we do now, in their ministrations to the sick. Peace to their mummied forms, they have long rested from their labors.

For over four hundred years the Jews lived in Egypt in a state of bondage. When a leader, who proved equal to the task of freeing, leading, and elevating them, appeared, they went forth as a nation well instructed in all the learning of their former masters. The Egyptians were the medical instructors of the Jews, as they were likewise of the Greeks.

The seed of knowledge thus planted produced among the first of these nations the sanitary laws which we read and admire to-day, and which must, in the early times in which they were framed, have accomplished a vast deal for the benefit of those for whom they were designed.

To the latter we owe the birth of that school of medicine, which, founded by the illustrious sage of Cos, four centuries before the birth of Christ, comes down to us as that to which we give our adherence to-day. Then came the Romans, adding to what the Greeks had taught them, to be succeeded by the Arabs, whose teachings come down to our own time in the writings of Rhazes, Avicenna, Haly-abbas, and Albucasis.

And now the accumulated experience of the ages was appropriated and added to by the developing nations of Europe, until those centuries which have received the name of the "Dark Ages," threw their pall of bigotry and retrogression over the civilized world, and benumbed the progress, and fettered the advance of all learning, science, and art. Thanks to the religious society of those times—to the old monks who with shorn crowns, and garments of serge, hoarded up the manuscript contributions of more liberal and learned periods—all recorded experience was not swept away; but safely garnered, and jealously watched, it was given forth as a rich boon to those who, during the sixteenth and seventeenth centuries, were to witness the dawn of a new era—the revival of learning, which had so long lain dormant and non-progressive.

If a dividing line can anywhere be drawn between ancient and modern medicine, between the periods which marked medicine as an art and medicine as a science, it would, with the greatest propriety, be drawn at about the latter half of the sixteenth and the commencement of the seventeenth centuries.

During this period, three great events occurred, which laid the foundation for that scientific research and accurate knowledge which were henceforth to place medicine among the sciences. These were the establishment of inductive philosophy, the perfection and utilization of the microscope, and the discovery of the circulation of the blood. The first of these prepared the minds of men for a new, rational, and safe method of study; the second afforded a means of studying, by the sense of sight, the microcosms concerned in anatomy, pathology, botany, and chemistry; and the third, giving evidence of the wonderful results of these methods of inquiry, opened new channels for thought, and prompted similar styles of investigation in other departments of medicine. This is the tripod upon which in the beginning rested the new-born science of medicine; these the three grand events which were to mark a new era in its history.

Then was it that Vesalius, and Paré, and Harvey, and Aselli, he to whom has been by some accorded the title of the "English Hippocrates," the illustrious Sydenham, lived and labored. And then, as the eighteenth century advanced, appeared as fruits of the new era in medicine, Boerhaave, Von Haller, Morgagni, Jenner, and the two Hunters.

It was in the first quarter of the seventeenth century that the important revolution, already referred to, occurred in the then existing systems of philosophy. The establishment of inductive philosophy by Francis Bacon, who has justly been styled "the father of experimental philosophy," unquestionably exerted a marked effect upon the methods of thought and investigation hitherto adopted in medicine. Influenced by the Baconian philosophy, from this period the habit of arguing from facts which had been carefully observed, and, wherever possible, tested by experiment, began to grow with steadiness; and it soon became evident that both moral and physical sciences were henceforth to combine in elevating our noble calling.

In the seventeenth century, too, a most marked influence was exerted upon medicine by the invention of the microscope, which

for a long time before this period had been known as a comparatively useless magnifying glass. Once rendered a practical device, it gave a wonderful stimulus to investigation and inquiry, lent precision to facts loosely fixed before; and to the vision of the histologist, the physiologist, the chemist, the botanist, and the pathologist, opened worlds whose very existence was not hitherto imagined. More plainly than by words it told them that there were things in heaven and earth not dreamed of in their philosophy. As the telescope taught the astrologer of old to see in place of a few shining stars, world beyond world, system beyond system, in distances too great even for human conception; so did the microscope open, to the enraptured vision of those who had hitherto groped in darkness, a microcosmic universe before unknown. Henceforth the old things of medicine were to pass away and all things to become new. The eyes of the brave Vesalius were as keen as ours, his intellect as bright, his devotion as great, but by the aid of this wonderful invention our eyes suddenly became a thousand times more penetrating than his, our limit of observation a thousand times more extended. The minute anatomy, the real seat of disease in each organ, became as clear to us as the gross anatomy was to him. What was for him a dark red mass penetrated by blood-vessels and nerves, became for us a collection of acini, surrounded by connective tissue and filled with cells. Then the diseased conditions of each of these elementary parts became, in a similar manner, comprehensible, and the road to still greater advances, from deeper study, could be seen opening up to the future.

There are thoughtful men who declare that so great has been the influence of the discovery of iron upon the development of civilization, that if it were even in our present advanced state taken away from us, we would not only cease to progress, but would absolutely retrograde into barbarism. In the same way it may be said that if we were to-day to lose the influence of the microscope, all progress in medicine would cease, and we should gradually lapse into the sloughs of uncertainty and speculation from which it has done so much to elevate us.

And now occurred a remarkable event for medicine which demonstrated the grand results of the combined application to its study of the moral and physical sciences: of inductive philosophy and anatomical research and experiment. In the first half of the seventeenth century William Harvey demonstrated to the world the circulation of the blood, and opened the flood-gates which were in future to pour a copious stream of knowledge upon physiology, and to enrich the science of medicine. Henceforth no foothold was to exist for the wild chimeras hitherto sustained in reference to the blood, its functions, and its course through the body. Harvey's opponents and detractors, whose name was "Legion," supported their views by argument; the great innovator enforced his by demonstration as clear, as convincing, and as unanswerable as the most certain deduction in mathematics. This grand discovery Bacon, a contemporary of Harvey, lived to see, but Vesalius, who opened the way for it had died sixty years before this glorious fruition of the seed which he had sown.

Who can tell how long, without Harvey's great work, impenetrable darkness would have continued, as of old, to encompass physiology, and the pathology and treatment of cardiac disorders? Who for a moment can suppose that without it medicine could ever have been, with reference to these affections, anything else than an empirical art? The possibility of drawing exact deductions from certainly-ascertained premises was attainable only by absolute physical demonstration. This was henceforth and forever entirely at our disposal.

At this late date it may be imagined that when, as in this case, science and empiricism grappled in conflict, the victory gained by the former was immediate, decisive, and unquestionable. Far from it! Harvey contended for a lifetime against bitter opposition and vindictive detraction. "Truth crushed to earth" does "rise again," but often it rises like an exhausted athlete, slowly, unsteadily, and feebly, till time has been given it in which to grow firm in the upright position. With Harvey's discovery it was but a question of time; ere long it had swept aside all opposition, vanquished all scepticism, and vindi-

cated its right to being considered a discovery equal in importance, as far as the benefit and happiness of mankind are concerned, to that of Columbus.

Up to this time medicine not only existed, but flourished, as an art; a noble, God-given art, which scattered its benefits lavishly. But at no period could the term science have ever been appropriately applied to it. It was pursued by wise, and good, and devoted men, but pursued as an empirical art, and as such was it handed from one civilization to another, as we have watched it passing onwards in its advance to the more modern times. But now, not by any sudden impulse or unexpected development, but by slow, laborious degrees, one man advancing here, another there, with many years intervening between them; each working some isolated strand into the forming structure—as it were line upon line, and precept upon precept; here a little and there a little, very gradually the science of medicine began to take form and to grow. Once securely established it has, during the last half century, made advances which have far surpassed those of any other period, and to-day we look upon it with satisfaction and pride, as bearing the relation to medicine as an art which the brain does to the members which it controls and directs.

None but an enthusiast can believe that medicine will ever become a pure and exact science. It must ever exist as a combination of science with art. Without the science to guide and instruct it, the art must remain pretty much what it was in the ages that have passed. Without the art, the science would stand a useless, profitless tissue of speculation. But the more completely the art becomes the handmaid of the science, the more certain will be its advancement, the more perfect its utility. Before we proceed let us pause here and inquire as to the true definitions of, and real distinctions which exist between, **a science and an art.**

I shall use the word “science” throughout this address in the broadest sense accorded to it by modern lexicographers, that which most perfectly distinguishes it from “art” and that which gives to it its most important and characteristic feature,

the acquirement through its instrumentality of knowledge which is absolutely certain. Science, derived from "*scio*, I know," may be said to consist in absolute, accurate knowledge which rests for its certainty upon immutable laws; art consists in the application of the precepts of science to a practical end or purpose. The end and aim of science is accurate knowledge; the function of art is the application of knowledge to the accomplishment of a given end. "A science," says Whewell, "is a body of principles and deductions to explain the nature of some matter. An art is a body of precepts with practical skill for the completion of some work. A science teaches us to know; an art, to do. In art, truth is a means to an end; in science, it is the only end."

As an art then, medicine is so old that it may truly be said to be coeval with civilization. As a science it is young, but its youth is vigorous, its growth rapid and healthy, and its prospects for the future most encouraging. The influences which have developed it in this respect in the past are those which are likely to do so in the future, and it behooves its well-wishers to carefully ascertain and industriously foster them.

I presume that it will to-day be generally accepted as truth, that the most marked feature of modern medicine, and that upon which, more than upon any other, has depended its gradual elevation from the field of speculation, uncertainty, and hypothesis, to that of certainty and exactitude, is the tendency to subordinate theory to experiment, to require for every dogma a demonstration, to push investigation by physical means to the utmost degree, and to accept nothing as fact which cannot give evidence of truth to the senses of the investigator. To this method of investigation, this mode of inquiry, are due these two important results: first, the shedding of floods of light upon places hitherto dark, obscure, and unfathomable, by subjecting them to means of physical exploration which have brought them under the influence of sight, hearing, and touch; second, the trampling down of formulas, the defiance of scholasticism, the explosion of arbitrary theories, the annihilation of seductive dogmas.

Before its adoption the organs of the body were to physicians like dark caverns with impracticable entrances, and the diseases which affected them were subjects for speculations and theories, such as only a century ago divided the profession into sects under the leadership of Stahl, Haller, Boerhaave, Brown, and Cullen. Once established, the day of the medical dreamer, who, like the cloistered monk, evolved seductive theories from the quietude of his study, passed away immediately and forever. The enunciator of high-sounding dogmas might still flourish among the people, for,

“ Faith, fanatic faith, once wedded fast
To some dear falsehood, hugs it to the last.”

But he could no longer take root in medical soil, for exposed to the rigid investigation of physical science, brayed in the mortar of accurate analysis, his theories were dissolved like the baseless fabric of a vision, leaving not a rack behind.

And more and more as each revolving year adds to our experience are the means of physical exploration and inquiry being pushed into new and hitherto almost unexplored fields. His pathway illuminated by these, the modern investigator, no longer groping in the dark like his forefathers, sees clearly into the recesses in which lurk disease, and draws his deductions from certain premises.

To physical science medicine is more especially indebted for the rapid advances which have marked its career in the century in which we live.

And here let us ask, what is physical science? To borrow the definition given by the most recent writer upon the subject, it is that science which “relies exclusively upon, and is advanced solely by means of observation through the senses and experiments addressed only to the senses. Here, in its own domain, sense reigns paramount and holds undivided sway. Physical science recognizes no facts which cannot, directly or indirectly, be made evident to sense. All its modes of verifying facts, *i. e.*, of discerning the false from the true, are founded, in the last resort,

solely upon the testimony of the senses." * This is the science which is forming to-day the corner-stone of medicine, a science which often depends so essentially, for the performance of its great functions, upon some simple mechanical contrivance, that we are in danger of confounding it with an art, and of losing sight of its own vast proportions.

It is wonderful to observe how much has been, in many instances, effected for the advance of a science by the invention of some instrument, mechanical contrivance, or plan for physical exploration and demonstration. Two of the most striking of these are to be found in the mariner's compass and the telescope, but there are many others scarcely less remarkable. Without the former, navigation, conducted by observation of the stars, must forever have remained an insignificant art, and worlds would have existed unknown and unsought for. Before the discovery of the latter, the astrologers, who pondered through the nights in vain contemplation and fruitless study of the celestial orbs, drawing horoscopes and predicting destinies, dominated science with their senseless babblings. But the far-discerning and exact instrument soon scattered them to the four winds of Heaven, and obliterated their influence and teachings, as the sun clears up the mists from the earth's surface.

And how multiform and various are the collateral advantages which flow from a discovery or invention which would at first sight seem to have no influence upon an improvement which follows it! It is certain that no sanitary laws, no hygienic enactment, no individual or national efforts could ever have done so much for the extinction of those desolating epidemics which formerly spread over Europe, as the invention of gunpowder has accomplished. While cities were defended and taken by hand to hand fighting, streets were made narrow and tortuous, the houses which bordered them were constructed high and overhanging, each one being a vantage ground for attack and defence, and from the dark and dismal and reeking byways the sun, with its vivifying and antiseptic rays, was banished almost completely. Here the germs of pestilence met

* Bowen's "Modern Philosophy."

with congenial soil, and grew with vigor. But the "vile salt-petre" compound which cast pellets of iron over wall and moat, over bastion and drawbridge, sending destruction from afar, rendered all this worse than useless, and induced the constructors of cities to admit the light and air to every by-way and alley.

The three great events, which have just been referred to, did more than aught besides to establish medicine as a science; but they did even more than this, they prepared the way for great results by opening new channels and indoctrinating new methods of thought and inquiry in the medical mind.

How often do we lose sight of the educational influences exerted by great discoveries; of the moulding of minds and generation of ideas which they accomplish! How different the standard by which we should judge those who lived after the events which we have just noted from that which applies with justice to those who existed before them! Among the ancient Egyptians it was firmly believed that the heart yearly increased in weight at the rate of two drachms until the age of fifty, when it steadily decreased in the same proportion. Every day thousands of dead bodies were opened and embalmed by men who could not but have had skill, intelligence, and curiosity; yet no one seems to have thought of applying to this arbitrary theory the test of examination by weight, sight, and touch! We can look with leniency upon such unquestioning credulity in minds undeveloped by the great discoveries of modern times; but it became impossible after the new methods of thought to which they gave rise.

During the seventeenth and eighteenth centuries these influences were felt, but it was not until the nineteenth that rapid and certain advances were made in the same direction. One of the most important of these was the discovery of auscultation and percussion for the elucidation of diseases of the lungs and heart. Before the discovery of these means, hap-hazard reasoning and conjecture marked the diagnosis of the diseases of those organs; after it, all became certain and precise. No longer did the physician judge of their condition by the pulse,

tongue, and rational signs which were well calculated to mislead. His sense of hearing came to his aid with all its discriminating powers.

And now with great rapidity we passed out of darkness into the light with reference to other organs. The ophthalmoscope, like the electric light illuminating buried hulks far down in the depths of the sea, made clear the deep tissues of the eye, showed the oculist the little blood-clots upon the retina, and the broken vessels from which they had escaped. The laryngoscope threw bright rays into the dark nooks within the larynx and enabled the operator by its light to see and remove little polypi, the very existence of which could not have been suspected otherwise. The speculum uteri opened the way to a proper study of the diseases of the womb and to a new field of pathology and treatment; and more recently still the sphygmograph offers itself as an exact method of recording the regularity and force of the pulse; and the spectroscope as a means of testing, by a most delicate process, the fluids of the body.

All these I have mentioned as examples of exact methods of investigation which have been stimulated and greatly fostered by the invention of some instrument. Two instances of exact methods not having this source are those which in our day are accomplishing so much good, and which are themselves making such rapid advances—medical chemistry and experimental physiology. The first, by examinations of the blood, the solid tissues and the excreta, is lending great aid to the physician. The second, in spite of that mandlin pseudo-philanthropy which decries it, in defiance of the sickly sentimentality which would hamper it, is doing more for the advancement of physiology, and therefore of medicine at large, than centuries of reasoning and speculation have accomplished.

Upon no department of medicine have exact methods of study excited a more beneficial influence than upon obstetrics. A hundred years ago obstetrics was an art alone. It could lay no claim to the name of science. Practised ever since the times of the Egyptian and Jewish midwives, entrusted to the hands of those who should have advanced it during the Greek, the Ro-

man, and the Arabian civilizations, taken from their hands with what of the added precepts of ages had been preserved in the meagre literature of those times, it went onward to the middle of the eighteenth century, almost a mechanic art, unilluminated by the light of science, uncertain in all that related to scientific deduction. In the last quarter of the eighteenth century there arose a man, who simply availing himself of the means which had for thousands of years been at the disposal of all who had preceded him, means which, it is extraordinary to think, did not enlighten the Egyptian embalmers, opened the way to scientific investigation for those who should succeed him. Before his time men had speculated as to the gravid uterus and its contents. After it speculation was replaced by certainty depending upon ocular demonstration. The work of William Hunter upon the gravid uterus is the corner-stone of obstetrics.

So simple the method, so grand the result, that there may be many here to-night who wonder that it was left for Hunter to develop. But have not you and I, almost within the last decade, been as much at fault as were his predecessors and contemporaries? Have we not sat hour after hour, day after day by the bedsides of patients, theorizing and guessing like empirics at the degree of fever from which our patient suffered, while in the same room hung a thermometer which would not only have made speculation certainty, but would have told us with almost equal certainty that the life over which we watched would pretty surely be soon extinct? Had we but thought of this, how much of science would have been developed to guide us as to prognosis and general management! But the suggestive thought did not arise, and hence we did not make one of the most important discoveries which has enriched modern medicine and done a vast deal towards making it a science.

Much has already been done, but much more remains to be accomplished. How broad are the fields which are open to investigation; how numerous the instances in which profit, and honor, and renown await the successful inquirer. We have no reason to doubt that the children of the Pharaohs staggered and gasped under the spasms of whooping-cough long before the

pyramids were erected. This singular affection has been a household pest ever since, and many a little grave has been tenanted by its influence. Yet what do you or I know more than the old Egyptian magi did of its etiology, pathology, or even its specific treatment? I see a score of practitioners eager to rise and contest the last assertion. But alas, they would rise to defend the claims not of one but of twenty specifics—of prussic acid, of quinine, of belladonna, of chloral, of chestnut leaves, and of a host of others whose very number proves our poverty of resources. And is it otherwise with Asiatic cholera, with yellow fever, and a long list of other diseases?

I think that I almost hear a whisper to the effect that the therapeutical department of medicine, owing to the different results produced by the same drug upon different constitutions, must ever remain, to a great extent, empirical. Granted: but is it not equally true that the surest method by which an exact and scientific therapeutics will be reached is through the scientific study of the disease to be treated? A few years ago, all with reference to the treatment of epilepsy was surrounded with doubt and empiricism. To-day, thanks to the careful study and research of Brown-Séquard, we are able to check the violence of the disorder, to keep it within limits in most cases, even to cure it in some. It is most true that this result might have been arrived at empirically, as mercury was adopted in the treatment of syphilis, and quinine in that of malarial fever. But the truth that empiricism and not science has so long guided us in therapeutics, probably accounts for the undeniable fact that so few specifics exist in medicine to-day.

Having mentioned mercury and the iodides in syphilis, cinchona and its principles in malarial fevers, the bromides in epilepsy, and the chlorate of potash in stomatitis, our enumeration is completed. Two thousand years and more have elapsed since the days of Hippocrates; two thousand years should have given us a longer list than this. But during two thousand years medicine was an empirical art; as a science, who can doubt that its results, even in the next half-century, will be far more prolific than they have been in the whole long past?

It is not, however, in the discovery of specifics for different maladies that we must chiefly hope for great results from scientific medicine. It is in the prevention, the intimate knowledge, and the general management of disease. Let me illustrate this remark by a reference to one disorder—phlegmasia alba dolens. When, as in the olden time, this affection was regarded as a metastasis of milk, and at a later period as an acute post-partum inflammation, we can, from our present standpoint, readily perceive how a variety of erroneous, empirical, and even absolutely injurious treatment was adopted for it. But, in time, science intervened and illuminated the pathology of the subject with her pure and certain rays. It was discovered that those events of inflammation, the “tumor, calor, dolor,” of the old writers, all existed as consequences of a coagulation of blood in the large veins of the leg, where they enter the pelvis and inosculate with veins connected with the uterus. Here then was a condition due in part to an inflammation occurring in the inner coats of the veins, and in part to the condition of hyperinosis, which characterizes the blood state of pregnancy. Even to the most brilliant intellect this knowledge would offer no suggestion of specific treatment, but even to the dullest it would say, in terms too plain to be misunderstood: leeching, and blistering, and rubbing cannot remove a hard and obstructing blood-clot from the vein which it closes; they cannot establish circulation in the limb which is swollen by dammed up fluids. Perfect rest, relief of pain by opiates and fomentations, sustaining the system by careful feeding, and the use of tonics, like quinine and its salts, restoring the depraved blood to its normal state by iron, lime, etc., and standing the siege of disease till time shall raise it, is the only method of meeting and counteracting the difficulty which common sense points out. The intervention of science here accomplishes two important ends: First, it stops the abstraction of blood from a system already suffering from hyperinosis, which blood-letting increases, and prevents the teasing of an already exhausted nervous system by friction, blistering, and other similar disturbing agencies; second, it prevents sensible men from tampering with

their patients by trying those specifics which the shallow enthusiasts of our body are eternally shouting that they have discovered.

See, too, how much modern pathology, under the guidance of the microscope and of medical chemistry, has accomplished in the disease now known as septicæmia. A collection of symptoms not long ago grouped together under one head, and attributed vaguely and arbitrarily to a condition styled inflammation, are now thoroughly analyzed and fully appreciated. Pathology has annihilated the phrase inflammation in such cases as completely as did the perfected balance in chemistry destroy the old and apparently impregnable "phlogistic" theory.

Are there any lessons which this examination of the forces, which have in the past been instrumental in advancing medicine, may teach us? Is there any moral to the tale which has been told? It is to be found in this formula: In the past medicine has gradually advanced from an art to a science through the adoption of means which render all theory subordinate to physical demonstration, which "recognize no facts which cannot, directly or indirectly, be made evident to sense;" and as it was in the past so will it certainly be in the future. Exact methods of study, physical exploration, physical demonstration, are the only sources from which reliable deductions can be drawn.

These are the influences which have thus far given to medicine its character as a science; these the processes of thought and inquiry which will perfect that character in the future; these the methods which we should ourselves pursue and instil into the minds of those who go forth from our schools to take their places in the ranks of our profession. At this moment thousands of able and devoted men are in various parts of the world striving, by an earnest application of physical science, to elevate medicine to a higher scientific standard, and wherever you see this endeavor most determinedly followed, there you see the nearest approximation to success. The thoughtful, honest, painstaking, and persevering students of Germany have in our day placed that country in advance of all others in scien-

tific medicine. And why? Because these are their methods of study, these their means of inquiry in laboratory and at the bedside. In purely scientific medicine, though in naught besides, America stands far behind her European sisters. And again let me ask why? Because Americans work too exclusively for the attainment of the practical and utilitarian in medicine; too much for medicine as an art, too little for medicine as a science. Far be it from any American to ignore or undervalue the scientific contributions of his country. They need not be enumerated here, for they are duly recorded in the annals of a profession which never forgets honest and deserving labor. In comparison, however, with her contributions to the art, those which she has made to the science are disproportionately small. America boasts with pardonable pride to-day of McDowell, of Mott, of Wells, and of Sims, who have given the most original and important discoveries to medicine as an art; but her Harvey, her Lavoisier, her Virchow, and her Graefe, remain yet hidden in the womb of time.

The day has surely come when a country which has done so much for the art of medicine should do proportionately more for the science; when men should arise who are willing to devote their lives to the search after truth; not as a means by which to coin gold and achieve position, but after truth for its own sake. That many such men will live amongst us in the future we all hope and believe. That many have lived in the past who has the hardihood to maintain?

If the premises which I offer you, and the deductions which I draw from them be correct, it becomes evident that the road to improvement and to national progress lies clearly open before us. Let us strive to place upon it the young men who are just devoting themselves to medicine by giving a proper direction to their labors and energies, and let this Academy recognize as one of its highest functions the duty of being prominent in this good work. Train the young practitioner in the very commencement of his career, not how to gain and hold a large practice; but how to study the diseased conditions with which he will meet; instil into his mind the habit

of so doing, and the surest blow will be struck at the root of our weakness. We may calculate with entire confidence upon the intelligence and devotion of the young physicians of America. The duty of the hour is to encourage, incite, and direct their willing hands to the most effectual method of accomplishing the desired end.

Of late we hear a great deal said about the advisability of increasing the length of college terms, of requiring fuller preparatory study, and of establishing more rigid examination in our schools. That these reforms would prove of value no one can doubt, but there are others which are equally needed. No more industrious, active, and ambitious class exists amongst us to-day than the medical students of the United States. If the curriculum of medical studies sends them forth superficial and unscientific practitioners, the fault is not theirs. It is we, their teachers, we who are wanting in our duties, we who fail in making them what they should be, through the inefficiency of our methods of training and instruction. Let the axe of reform be laid at the root, and not used upon the branches of the tree, if any great results are aimed at. Let us teach our students more in the laboratory and at the bedside, and less in the didactics of the lecture room. Let us teach them rather how to study disease by the aid of all the exact methods at our disposal, than fill their minds with the teachings of books. Let us make them work and observe; let us inspire them with a spirit of personal inquiry, and incite them to personal investigations rather than send them forth, their brains teeming with multiform theories, their memories overloaded with a mass of crude material poured into them from the rostrum of the lecture room.

America has learned many a lesson from Europe, and often has she returned it with interest to those who gave. Let her but learn this one, and, in the words of Shylock, she will surely ere long be able to say,

"It shall go hard,
But I will better the instruction."

